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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,713	11/20/2007	Charles A. Dimarzio	NU-631XX	8694

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EXAMINER	
LEE, HWA S	

ART UNIT	PAPER NUMBER
2886	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,713	DIMARZIO ET AL.	
	Examiner	Art Unit	
	Hwa S. Lee (Andrew)	2886	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/29/07.10/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 10 depends on claim 1 which is drawn to the structure of an apparatus. Claim 10, however, further limits the turbid media which is not part of the apparatus, and thus claim 10 does not further limit the structure of the apparatus.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements or steps, such omission amounting to a gap between the elements. See MPEP § 2172.01. The elements/steps that produce the DC offset that is a function of a modulated photon density in the interaction region of the turbid medium is critical and essential.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Monchalin et al (US 5,131,748).

Monchalin et al (Monchalin hereinafter) show broadband optical detection of transient motion comprising:

a sound source (column 4, line 63);

a light source (12); and

a photo-detector (20, 34)

The limitations of "operative to…" do not positively recite that the elements perform the function in the apparatus but rather only recite what the element is capable of performing, and thus are not given patentable weight. Since the recited elements are shown by Monchalin, the elements are capable of performing the claimed function. Furthermore, claims 1-10 are drawn to the structure of the apparatus and the turbid media is not an element of the apparatus. Thus the turbid media does not further limit the structure of the apparatus.

With regards to the "wherein" clauses, the clauses are narrative and do not recite a further structural limitation of the apparatus. Although Monchalin does not expressly show the result that the intensity modulated signal beam has a DC offset that is a function of a modulated photon density in the interaction region of the turbid medium, and that the DC offset is indicative of an object or an abnormality at the interaction region of the turbid medium, Monchalin shows the

same elements as claimed, and therefore the same outcome would result from the claimed elements.

With respect to claims 2 and 3, Monchalin shows a piezoelectric transducer (column 4, line 63).

With respect to claims 4 and 5, Monchalin shows a laser (12) and it would inherently be a coherent beam for the interferometric measurement.

With respect to claim 6, Monchalin shows a photo-refractive crystal (20).

With respect to claim 7, Monchalin shows a beam splitter (14, 54, 58, 104) and the photorefractive crystal is capable of performing the claimed function.

3. Claims 1, 2 , 4-8, 10-12, 14-16, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dolfi et al (US 5,174,298).

Dolfi et al (Dolfi hereinafter) show an imaging process and apparatus comprising:

a sound source (TA1, TA2);

a light source (L); and

a photo-detector (AMP, D)

With respect to **claim 1**, the limitations of "operative to…" do not positively recite that the elements perform the function in the apparatus but rather only recite what the element is capable of performing, and thus are not given patentable weight. Since the recited elements are shown by Dolfi, the elements are capable of performing the claimed function. Furthermore,

claims 1-10 are drawn to the structure of the apparatus and the turbid media is not an element of the apparatus. Thus the turbid media does not further limit the structure of the apparatus. In addition, the "wherein" clauses are narrative and do not recite a further structural limitation of the apparatus since the limitation are reciting the outcome of the claimed structural elements.

Although Dolfi does not expressly show the result that the intensity modulated signal beam has a DC offset that is a function of a modulated photon density in the interaction region of the turbid medium, and that the DC offset is indicative of an object or an abnormality at the interaction region of the turbid medium, Dolfi shows the same elements as claimed, and therefore the same outcome would result from the claimed elements.

With respect to **claim 2**, Dolfi shows the acoustic transducer (TA1, TA2).

With respect to **claims 4, 5, 14, and 15**, Dolfi shows a coherent laser (column 7, line 29)

With respect to **claims 6 and 16,** Dolfi shows a photo-refractive crystal (AMP).

With respect to **claim 7**, Dolfi shows a beam splitter (S1) and the photorefractive crystal is capable of performing the claimed function.

With respect to **claim 8**, Dolfi shows a photodiode (column 8, line 18).

With respect to **claims 10** and 18, Dolfi shows a biological tissue (column 1)

With respect to **claim 11**, Dolfi shows:

generating an ultrasonic wave for propagation through an optically turbid medium;

generating a signal light beam;

directing the signal beam toward the turbid medium,wherein the signal beam is phase modulated in the presence of the ultrasonic wave within an interaction region of the turbid medium; and

converting the phase modulated signal beam to an intensity modulated signal beam,

Dolfi does not expressly show the result that the intensity modulated signal beam has a DC offset that is a function of a modulated photon density in the interaction region of the turbid medium, and that the DC offset is indicative of an object or an abnormality at the interaction region of the turbid medium. However, Dolfi shows the same steps being performed as claimed, and therefore the same outcome would result from the steps performed

With respect to **claim 12**, Dolfi shows the source to be an acoustic transducer

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 3 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dolfi in view of Monchalin.

Dolf shows all the elements and steps as discussed above with respect to claims 1 and 11 but does not expressly show the acoustic transducer to be a piezoelectric transducer. Monchalin shows a piezoelectric transducer to produce acoustic waves. At the time of the invention, one of ordinary skill in the art would have modified Dolfi to use a piezoelectric transducer for the expected result of producing acoustic waves.

6. **Claims 9 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Monchalin in view of Brodeur et al (US 6,115,127) and Dolfi in view of Brodeur et al respectively.

Monchalin and Dolfi show all the steps and elements as discussed for claims1 and 11 above, respectively. Monchalin and Dolfi do not show an AC field provided to the photo-refractive crystal.

Brodeur et al (Brodeur hereinafter) show non-contact measurements of ultrasonic waves using a photorefractive interferometer wherein Brodeur teaches that applying a AC high voltage to the photorefractive crystal.

At the time of the invention, one of ordinary skill in the art would have modified Monchalin and Dolfi by applying a AC high voltage to the photorefractive crystal in order to overcome a small gain in the crystal, move more electrons from the bright fringes to the dark fringes of the interference patterns within the crystal and thus creates a stronger electric field

grating. Second, it shifts the phase of the electric field closer to quadrature from the interference grating.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hwa S. Lee (Andrew) whose telephone number is 571-272-2419. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on 571-272-2800. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hwa S. Lee (Andrew)/
Primary Examiner, Art Unit 2886